



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,811	04/13/2007	Spartak Gevorgian	0110-096	6634
42015 7590 01/16/2008 POTOMAC PATENT GROUP PLLC P. O. BOX 270 FREDERICKSBURG, VA 22404			EXAMINER TRAN, CHUC	
			ART UNIT 2821	PAPER NUMBER
			NOTIFICATION DATE 01/16/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

tammy@ppglaw.com

Office Action Summary	Application No.		Applicant(s)	
	10/597,811		GEVORGIAN ET AL.	
	Examiner		Art Unit	
	Chuc D. Tran		2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-38,43,45-50,55 and 60-62 is/are rejected.
- 7) ☒ Claim(s) 39-42,44,51-54 and 56-59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “resonators” in claims 34-36, the “phase modulator” in claim 48, the “three-dimensional radiator array” in claim 61 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show “dielectric or ferroelectric layers are provided on sides of the first and second metal layers and are not in contact with the ferroelectric layer” as described in the specification. Any structural detail that is

essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 62 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. How the “method of changing the phase and amplitude” in claim 62 works without recited in independent claim 32.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 32-38, 43, 45, 47-50 and 60-62 are rejected under 35 U.S.C. 102 (e) as being anticipated by West et al (USP. 6,972,727).

Regarding claims 32, 47, West disclose a tunable microwave/millimeter-wave arrangement transmission antenna in Fig. 3, comprising: a tunable impedance surface structure (19), ferroelectric layer (21) (Col. 4, Line 13-18), first top metal layer (23) and second metal layer (22) are disposed on opposite sides of the ferroelectric layer (21) (Fig. 3); the first metal layer is patterned (formed) (Col. 4, line 18 and 33); and a dielectric permittivity of the at least one ferroelectric layer is dependent on a DC biasing voltage applied directly or indirectly to at least one of the first and second metal layers disposed on different sides of the at least one ferroelectric layer (Col. 4, Line 31).

Regarding claims 33-38, West disclose in Fig. 5 that the first metal layer comprises an array, patch radiators (resonator) (11) (Col. 5, Line 4), the radiators form a two- dimensional (2D) array antenna (Col. 1, line 20), the patch resonator (11) are rectangular Fig. 5, wherein the 2D array antenna comprises a reflective antenna (30) (Col. 4, line 64).

Regarding claim 43, West disclose that varying the DC biasing voltage varies an impedance of the array of radiators from inductive to capacitive (Col. 4, Line 53-58).

Regarding claim 45, West disclose that the arrangement comprise a transmission antenna (30)

Regarding claim 48, West disclose that a wave-front phase modulator for changing a phase of a transmitted microwave signal (Col. 4, Line 55-58).

Regarding claim 49, West disclose that the DC biasing voltage applied to each radiator is controllable via an impedance device (Col. 4, Line 31 and 54-58) (Fig. 3 and 4).

Regarding claim 50, West disclose that the arrangement comprises a beam scanning antenna (30) (Fig. 5).

Regarding claim 60, West disclose that a spacing between adjacent radiators corresponds to a factor of about 0-1.5 times a wavelength (Col. 7, Line 35).

Regarding claim 61, West disclose that a three-dimensional tunable radiator array (Fig. 8).

Regarding claim 62, West disclose that for changing at least one of a phase and amplitude distribution of the signals reflected and/or transmitted through the arrangement (Col. 6, Line 55-60) (Abstract).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 46 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over West in view of Toncich et al (USP. 6,756,947).

Regarding claims 46 and 55, West disclose the tunable microwave as set forth in the claims except a thickness of the ferroelectric layer is between about 1 micrometer and several millimeters, and the DC biasing voltage ranges from 0 volts to several thousand volts and dielectric layers are provided on sides of the first and second metal layers and are not in contact with the ferroelectric layer. Toncich disclose the tunable microwave comprising a thickness of the ferroelectric layer is between about 1 micrometer (Tonicich, Col. 5, Line 56), and the DC biasing voltage ranges from 0 volts to 3.3 volts (Col. 5, line 62) and dielectric layers (910) are provided on sides of the first and second metal layers (Fig. 9) and are not in contact with the ferroelectric layer (Fig. 9) (Col. 13, Line 19). Thus, it would have been obvious to one of ordinary skill in the art to modify West' system by providing the thickness of the ferroelectric layer and the DC biasing voltage ranges as taught by Toncich. Using the known technique of the thickness of the ferroelectric layer and the DC biasing voltage ranges for changing the resonant frequency in the conventional design antenna of West would have been obvious to one of ordinary skill.

Allowable Subject Matter

8. Claims 39-42, 44, 51-54 and 56-59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Application/Control Number:
10/597,811
Art Unit: 2821

Page 7

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuc D. Tran whose telephone number is (571) 272-1829. The examiner can normally be reached on M-F Flex hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC
January 5, 2008

Douglas W. Owens 1/7/08

DOUGLAS W. OWENS
SUPERVISORY PATENT EXAMINER